Bootsole Project

Management Indicator Species Report

Plumas National Forest Service

Beckwourth Ranger District

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Introduction

The purpose of this report is to evaluate and disclose the impacts of the Bootsole Project on the ten (10) Management Indicator Species (MIS) identified in the Plumas National Forest (NF) Land and Resource Management Plan (LRMP) (USDA 1988) as amended by the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (USDA 2007). This report documents the effects of the proposed action on the habitat of selected MIS.

MIS are animal species identified in the SNF MIS Amendment Record of Decision (ROD) signed December 14, 2007, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). The current rule applicable to project decisions is the 2004 Interpretive Rule, which states "Projects implementing land management plans…must be developed considering the best available science in accordance with §219.36(a)…and must be consistent with the provisions of the governing plan." (Appendix B to §219.35). Guidance regarding MIS set forth in the 1988 Plumas LRMP as amended by the 2007 SNF MIS Amendment ROD directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitat of each MIS affected by such projects, and (2) at the bioregional scale, monitor populations and/or habitat trends of MIS, as identified in the 1988 LRMP as amended.

Direction Regarding the Analysis of Project-Level Effects on MIS Habitat

Project-level effects on MIS habitat are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project on MIS habitat by discussing how direct, indirect, and cumulative effects would change the habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the type of monitoring identified for MIS in the LRMP as amended by the SNF MIS Amendment ROD. Hence, where the Plumas NF LRMP as amended by the SNF MIS Amendment ROD identifies distribution population monitoring for an MIS, the project-level effects analysis for that MIS is informed by available distribution population monitoring data, which are gathered at the bioregional scale. The bioregional scale monitoring identified in the 1988 Plumas NF LRMP, as amended, for MIS analyzed for the Bootsole Project is summarized in Section 3 of this report.

Adequately analyzing project effects to MIS generally involves the following steps:

- Identifying which habitat and associated MIS that would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Summarizing the bioregional-level monitoring identified in the LRMP, as amended, for this subset of MIS.
- Analyzing project-level effects on MIS habitat for this subset of MIS.
- Discussing bioregional scale habitat and/or population trends for this subset of MIS.
- Relating project-level impacts on MIS habitat to habitat and/or population trends at the bioregional scale for this subset of MIS.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (USDA 2006a). This MIS Report documents application of the above steps to select and analyze MIS for the Bootsole Project.

Direction Regarding Monitoring of MIS Population and Habitat Trends at the Bioregional Scale.

The bioregional scale monitoring strategy for the Plumas NF's MIS is found in the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (ROD) of 2007 (USDA Forest Service 2007). Bioregional scale habitat monitoring is identified for all twelve of the terrestrial MIS. In addition, bioregional scale population monitoring, in the form of distribution population monitoring, is identified for all of the terrestrial MIS except for the greater sage-grouse (not a Plumas MIS). For aquatic macroinvertebrates, the bioregional scale monitoring identified is Index of Biological Integrity and Habitat. The current bioregional status and trend of populations and/or habitat for each of the MIS is discussed in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA 2010a).

MIS Habitat Status and Trend.

All habitat monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA 2007).

Habitats are the vegetation types (for example, early seral coniferous forest) or ecosystem components (for example, snags in green forest) required by an MIS for breeding, cover, and/or feeding. MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components (USDA 2007), as listed in Table 1. These habitats are defined using the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005). The CWHR System provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). It is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Habitat status is the current amount of habitat on the Sierra Nevada Forests. Habitat trend is the direction of change in the amount of habitat over time. The methodology for assessing habitat status and trend is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

MIS Population Status and Trend.

All population monitoring data are collected and/or compiled at the bioregional scale and consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA 2007). The information is presented in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Population monitoring strategies for MIS of the Plumas NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment ROD (USDA Forest Service 2007). Population status is the current condition of the MIS related to the population monitoring data required in the 2007 SNF MIS Amendment ROD for that MIS. Population trend is the direction of change in that population measure over time.

There are a myriad of approaches for monitoring populations of MIS, from simply detecting presence to detailed tracking of population structure (USDA 2001, Appendix E, page E-19). A distribution population monitoring approach is identified for all of the terrestrial MIS in the 2007 SNF MIS Amendment, except for the greater sage-grouse (USDA Forest Service 2007). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time, and tracks these changes in the distribution of each MIS at the Sierra Nevada scale by monitoring

the changes in the presence of the species across a number of sample locations. Presence data are collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The specifics regarding how these presence data are analyzed to track changes in distribution over time vary by species and the type of presence data collected, as described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Aquatic Macroinvertebrate Status and Trend.

For aquatic macroinvertebrates, condition and trend is determined by analyzing macroinvertebrate data using the predictive, multivariate River Invertebrate Prediction and Classification System (RIVPACS) (Hawkins 2003) to determine whether the macroinvertebrate community has been impaired relative to reference condition within perennial water bodies. This monitoring consists of collecting aquatic macroinvertebrates and measuring stream habitat features according to the Stream Condition Inventory (SCI) manual (Frasier et al. 2005). Evaluation of the condition of the biological community is based upon the "observed to expected" (O/E) ratio, which is a reflection of the number of species observed at a site versus the number expected to occur there in the absence of impairment. Sites with a low O/E scores have lost many species predicted to occur there, which is an indication that the site has a lower than expected richness of environmentally sensitive species and is therefore impaired.

Selection of Project level MIS

Management Indicator Species (MIS) for the Plumas NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007). The habitats and ecosystem components and associated MIS analyzed for the Bootsole Project were selected from this list of MIS, as indicated in Table 1. In addition to identifying the habitat or ecosystem components (1st column), the CWHR type(s) defining each habitat/ecosystem component (2nd column), and the associated MIS (3rd column), the table discloses whether or not the habitat of the MIS is potentially affected by the Bootsole Project (4th column).

Table 1. Selection of MIS* for Project-Level Habitat Analysis for the Bootsole Project

Habitat or Ecosystem Component	**CWHR Type(s) defining the habitat or ecosystem component[1]**	**Sierra Nevada Forests Management Indicator Species** ***Scientific Name***	**Category for Project Analysis [2]**
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	1
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH)	fox sparrow *Passerella iliaca*	2
Oak-associated Hardwoods & Hardwood/conifers	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer *Odocoileus hemionus*	2
Riparian	montane riparian (MRI)	yellow warbler *Dendroica petechia*	1
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific tree (Chorus) frog *Pseudacris regilla*	3
Early Seral Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	mountain quail *Oreortyx pictus*	3

Mid Seral Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	mountain quail *Oreortyx pictus*	3
Late Seral Open Canopy Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	sooty (blue) grouse *Dendragapus obscurus*	2
Late Seral Closed Canopy Coniferous	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl *Strix occidentalis occidentalis*	2
		northern flying squirrel *Glaucomys sabrinus*	2
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker *Picoides villosus*	3
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker *Picoides arcticus*	1

* American Marten and Greater Sage Grouse are not MIS for the Plumas NF (USDA Forest Service 2007a)

1 All CWHR size classes and canopy closures are included unless otherwise specified; dbh = diameter at breast height; Canopy Closure classifications: S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); Tree size classes: 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(>24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

2 Category 1: MIS whose habitat is not in or adjacent to the analysis area and would not be affected by the project.

Category 2: MIS whose habitat is in or adjacent to analysis area, but would not be either directly or indirectly affected by the project.

Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

The MIS whose habitat would be either directly or indirectly affected by the actions proposed for the Bootsole Project, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS.

The Bootsole Project proposes to treat coniferous forest areas through mechanical thinning, mechanical fuel treatments, hand thinning, and underburning and would directly or indirectly affect the following CWHR types: wet meadow, grassland, early, and mid seral coniferous forest in all canopy cover and size classes, and medium and large snags in green forest. The CWHR type defining the habitat or ecosystem components represented for aquatic invertebrates, fox sparrow, mule deer, yellow warbler, blue grouse, California spotted owl, northern flying squirrel, and black-backed woodpecker would not be directly, indirectly or cumulatively impacted by the proposed action (lacustrine and riverine, shruband, oak associated hardwoods, montane riparian, late seral open canopy coniferous forests of CHWR 5, late seral closed canopy coniferous forests of CHWR 5 and 6, and snags in burned forest).

Bioregional Monitoring Requirements for MIS Selected for Project-Level Analysis

MIS Monitoring Requirements.

The Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007) identifies bioregional scale habitat and/or population monitoring for the Management Indicator Species for ten National Forests including the Plumas NF. The habitat and/or population monitoring requirements for Plumas NF's MIS are described in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a) and are summarized below for the MIS being analyzed for the Bootsole Project. The applicable habitat and/or population monitoring results are described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a) and are summarized in Section 5 below for the MIS being analyzed for the Bootsole Project.

Habitat monitoring at the bioregional scale is identified for all the habitats and ecosystem components, including the following analyzed for the Bootsole Project: Riverine/lacustrine; grassland; shrubland/chaparral; montane riparian, early seral coniferous forest; mid seral coniferous forest; late seral open canopy coniferous forest; late seral closed canopy coniferous forest; snags in green forest.

Bioregional Monitoring for aquatic macroinvertebrates: Index of Biological Integrity (IBI) and habitat condition and trend are measured by collecting aquatic macroinvertebrates, and analyzing the resulting data using the River Invertebrate Prediction and Classification System (RIVPACS) (Hawkins 2003) to determine whether the macroinvertebrate community has been impaired relative to reference condition within perennial water bodies. In addition, stream habitat features are measured according to the Stream Condition Inventory (SCI) manual (Frasier et al. 2005).

Population monitoring at the bioregional scale for fox sparrow, yellow warbler, mountain quail, sooty grouse, California spotted owl, northern flying squirrel, and hairy woodpecker is based on distribution population monitoring. Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time (also see USDA 2001, Appendix E).

How MIS Monitoring Requirements are Being Met.

Habitat and/or distribution population monitoring for all MIS is conducted at the Sierra Nevada scale. Refer to the 2010 SNF Bioregional MIS Report (USDA 2010a) for details by habitat and MIS.

Description of Proposed Project.

Project design criteria include standards & guidelines identified in Table 2 of the Supplemental SNFPA (USDA 2004) Record of Decision, and the use of limited operating periods identified in Table 16 of the Bootsole Project Biological Evaluation.

Geographic Analysis Area

The action area is defined as the units to be treated, which equals approximately 4,233 acres. The wildlife analysis area is the same for both terrestrial and aquatic species, comprised of 14,508 acres. The watersheds delineated for analysis encompass areas where actions are proposed and/or cumulative effects with the proposed action are potentially significant.

Table 2. Summary of California Wildlife Habitat Relationships (CWHR) types within the Bootsole Project wildlife analysis area (14,508 acres; all acres are approximate and National Forest System lands).

Seral Stage	CWHR Code	Acres of existing condition in analysis area	Acres of existing condition in units
Conifer Forest - Late Seral Closed Canopy	5M, 5D, 6	1,315	0
Conifer Forest - Late Seral Open Canopy	5P, 5S	313	0
Conifer Forest - Mid Seral, Closed-Dense Canopy	4M, 4D	3,924	470
Conifer Forest - Mid Seral, Open-Sparse Canopy	4S, 4P, 4X	3,870	589
Conifer Forest - Early Seral	Size Class 1-3	3,878	3,068
Hardwood Forest		19	0
Shrub Dominated		636	0
Grassland		345	106
Non-Vegetated		208	0
Total		14,508	4,233

Conifer forest includes EPN, JPN, PPN, SMC and WFR; Hardwood Forest includes ASP and MHC; Grassland includes AGS, PGS and WTM; Shrub dominated includes MCH, MRI, MCP and SGB; Non-vegetated includes BAR, LAC and WAT. Size Class: 1 = Seedling Tree <1" dbh, 2 = Sapling Tree 1 - 6" dbh, 3 = Pole Tree 6 - 11" dbh, 4 = Small Tree 11 - 24"dbh, 5 = Medium/Large Tree >24"dbh,6 = Multi-layered Tree. Canopy Cover: D = Dense Canopy Cover (> 60%), M = Moderate Canopy Cover (40 - 59%), P = Open Canopy Cover (25 – 39%), S = Sparse Canopy Cover (10 – 24%).

Table 3. CWHR types in the Bootsole Project wildlife analysis area and treatment units.

CWHR	Existing Condition	Acres Treated
Meadows (AGS, PGS, WTM)	345	106
Brush (MCP, SGB)	636	0
BAR	208	0
Early Seral, Sparse Canopy (EPN 2S - D3S, 3P, SMC 3S, 3P; JPN3P-, SMC 2S-D, 3P)	1,702	1096
EPN3M, SMC 3M	1,149	1,042
EPN3D, SMC 3D	1,027	930
EPN4S, JPN 4S, SMC4P	710	0
EPN4P, FPN4P, SMC 4P	3,160	589
EPN4M, SMC4M	2,971	379
EPN4D, MHC4D, SMC4D	953	91
EPN5P, SMC5P	290	0
EPN5M, SMC5M	840	0
EPN5D, SMC5D	475	0
Grand Total	14,508*	4,233*

*Calculated acres may not add up to the total indicated due to rounding

Effects of Proposed Project on the Habitat for the Selected Project-Level MIS.

The following section documents the analysis for the following 'Category 3' species: aquatic macro invertebrates, fox sparrow, mule deer, yellow warbler, pacific tree frog, sooty grouse, mountain quail, California spotted owl, northern flying squirrel, and hairy woodpecker.

The analysis of the effects of the Bootsole Project on the MIS habitat for the selected project-level MIS is conducted at the project scale. The analysis used the following habitat data: Forest wide vegetation typing into CWHR habitat classifications was done for the Plumas-Lassen Administrative Study in 2002 (Vestra, 2002). This vegetation layer is updated after the fires on the Plumas NF using vegetation severity maps and aerial photos. Detailed information on the MIS is documented in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Cumulative effects at the bioregional scale are tracked via the SNF MIS Bioregional monitoring, and detailed in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Wet Meadow Habitat (Pacific tree frog)

Habitat/Species Relationship.

The Pacific tree frog was selected as an MIS for wet meadow habitat in the Sierra Nevada. This broadly distributed species requires standing water for breeding; tadpoles require standing water for periods long enough to complete aquatic development, which can be as long as 3 or more months at high elevations in the Sierra Nevada (CDFG 2005). During the day during the breeding season, adults take cover under clumps of vegetation and surface objects near water; during the remainder of the year, they leave their breeding sites and seek cover in moist niches in buildings, wells, rotting logs or burrows (ibid).

Project-level Effects Analysis – Wet Meadow Habitat

Habitat Factor(s) for the Analysis

1. Acres of wet meadow habitat (WTM and AGS)
2. Acres with changes in CWHR herbaceous height classes
3. Acres with changes in CWHR herbaceous ground cover classes
4. Changes in meadow hydrology

Current Condition of the Habitat Factor(s) in the Project Area

There are 345 acres typed as wet meadow (WTM), annual grasslands (AGS), and perennial grasslands (PGS) by CWHR data within the Bootsole Wildlife Analysis Area (Table 3).

Direct and Indirect Effects to Habitat.

106 acres will be treated with mechanical thinning (where possible) and hand thinning to remove encroaching conifers. Project activities would act to restore loss of wet meadow habitat due to conifer encroachment and improve meadow hydrology.

Cumulative Effects to Habitat in the Analysis Area

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the Bootsole Project BE.

Cumulative Effects Conclusion

Wet meadow habitat would be improved from current conditions.

Summary of Pacific Tree Frog Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the Pacific tree frog; hence, the wet meadow effects analysis for the Bootsole Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the Pacific tree frog. This information is drawn from the detailed information on habitat and population trends in the SNF Bioregional MIS Report (USDA Forest Service 2008), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 66,000 acres of wet meadow habitat on National Forest System lands in the Sierra Nevada. Within the last decade, the trend is stable.

Population Status and Trend

Since 2002, the Pacific tree frog has been monitored on the Sierra Nevada forests as part of the Sierra Nevada Forest Plan Amendment (SNFPA) monitoring plan (USDA Forest Service 2006b, 2007; Brown 2008). These data indicate that Pacific tree frog continues to be present at these sample sites, and current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of Pacific tree frog populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Pacific Tree Frog Trend

The direct, indirect and/or cumulative effects of the Bootsole Project with the proposed action would change very little with time the amount and distribution of WTM habitat currently existing within the analysis area; there would be no net reduction and an expected improvement in the long-term health and distribution of WTM in the Bootsole analysis area. Therefore the change in the amount of wet meadow habitat in the Bootsole Project analysis area would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of Pacific tree frogs across the Sierra Nevada bioregion.

Early and Mid-Seral Coniferous Forest Habitat (Mountain quail)

Habitat/Species Relationship.

The mountain quail was selected as the MIS for early and mid seral coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, red fir, and eastside pine) habitat in the Sierra Nevada. Early seral coniferous forest habitat is comprised primarily of seedlings (<1" dbh), saplings (1"-5.9" dbh), and pole-sized trees (6"-10.9" dbh). Mid seral coniferous forest habitat is comprised primarily of small-sized trees (11"-23.9" dbh). The mountain quail is found particularly on steep slopes, in open, brushy stands of conifer and deciduous forest and woodland, and chaparral; it may gather at water sources in the summer, and broods are seldom found more than 0.8 km (0.5 mi) from water (CDFG 2005).

Project-level Effects Analysis – Early and Mid Seral Coniferous Forest Habitat

Habitat Factor(s) for the Analysis

1. Acres of early (CWHR tree sizes 1, 2, and 3) and mid seral (CWHR tree size 4) coniferous forest
2. Acres with changes in CWHR tree size class.
3. Acres with changes in tree canopy closure.
4. Acres with changes in understory shrub canopy closure.

Current Condition of the Habitat Factor(s) in the Analysis Area

Approximately 3,878 acres of early seral and 7,794 acres of mid seral conifer forest habitat are present within the Bootsole analysis area (Table 3). Mid seral conifer forest makes up more than half of the forest stands in the Bootsole analysis area.

Direct and Indirect Effects to Habitat.

The Bootsole Project would affect both early and mid-seral trees; mid-seral forest is the most prevalent in the project area and in the most need of thinning. The biggest change will be in density, opening up dense stands of small to medium sized trees. The proposed action would increase the amount of open canopy, early and mid seral coniferous forest habitat while reducing the amount of closed canopy, early and mid seral habitat. This change should benefit the mountain quail, since they prefer more open forested stands.

Approximately 35% (4,127 acres) of the early seral and mid seral conifer forest in the Bootsole Wildlife Analysis Area is proposed for mechanical thin, mechanical fuels, and/or hand thin treatments under the proposed action. All acres are proposed to have underburing, either as primary treatment or as follow-up treatment to thinning. These treatments would not result in type change for mountain quail. Overall, habitat and ecosystem components for mountain quail remain essentially the same as existing conditions, with no net decline in habitat with the proposed action alternative.

Cumulative Effects to Habitat in the Project Area

Past, present, and reasonably foreseeable future actions affecting the habitat in the project area have been identified in the project EA.

Cumulative Effects Conclusion

The proposed action would not result in a decrease in early or mid-seral habitat.

Summary of Mountain Quail Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the mountain quail; hence, the early and mid-seral coniferous forest effects analysis for the Bootsole Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the mountain quail. This information is drawn from the detailed information on habitat and population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 530,851 acres of early seral and 2,776,022 acres of mid seral coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend for early seral is decreasing (changing from 9% to 5% of the acres on National Forest System lands) and the trend for mid seral is increasing (changing from 21% to 25% of the acres on National Forest System lands).

Population Status and Trend

Monitoring of the mountain quail across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes fox sparrow, hairy woodpecker, and yellow warbler (USDA Forest Service 2010a, http://data.prbo.org/partners/usfs/snmis/). Mountain quail were detected on 40.3 percent of 1659 point counts (and 48.6% of 424 playback points) in 2009 and 47.4% of 2266 point counts (and 55.3% of 492 playback points) in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.103 in 2009 and 0.081 in 2010. These data indicate that mountain quail continue to be distributed across the 10 Sierra Nevada National Forests. In addition, mountain quail continue to be monitored and surveyed in the Sierra Nevada at various sample locations by hunter survey, modeling, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008).Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of mountain quail populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Mountain Quail Trend

Mechanical thinning, mechanical fuels, and hand thinning would open up the understory to allow the increased production of forbs that should be beneficial to mountain quail. The proposed action would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of mountain quail across the Sierra Nevada bioregion.

Snags in Green Forest Ecosystem Component (Hairy woodpecker)

Habitat/Species Relationship

The hairy woodpecker was selected as the MIS for the ecosystem component of snags in green forests. Medium (diameter breast height between 15 to 30 inches) and large (diameter breast height greater than 30 inches) snags are most important. The hairy woodpecker uses stands of large, mature trees and snags of sparse to intermediate density; cover is also provided by tree cavities (CDFG 2005). Mature timber and dead snags or trees of moderate to large size are apparently more important than tree species (Siegel and DeSante 1999).

Project-level Effects Analysis - Snags in Green Forest Ecosystem Component

Habitat Factor(s) for the Analysis

1. Green forest acres potentially supporting medium and large snags within the terrestrial wildlife analysis area (CWHR size class 4, 5, and 6).

Current Condition of the Habitat Factor(s) in the Terrestrial Wildlife Analysis Area

Based on the CWHR vegetation data, approximately 65% or 9,422 acres within the wildlife analysis area may be supporting medium to large (CWHR size class 4, 5, and 6) snags.

Direct and Indirect Effects to Habitat

The proposed action would treat 7% (1,059 acres) of suitable habitat, likely reducing existing and future snags through thinning and underburning activities. Snags would likely be both consumed and created through underburning activities. Project design features would retain four of the largest snags per acre in Sierra mixed conifer types and eastside pine forest types. Snags larger than 15 inches DBH and 20 feet in height would be used to meet this guideline. Because minimum snag levels would be retained, treated acres would remain suitable for hairy woodpecker. 93% of CWHR types identified as green forest supporting snags within the analysis area would not be treated under this project, those acres would continue to provide suitable habitat for hairy woodpecker.

Cumulative Effects to Habitat

The existing condition reflects the changes of all activities that have occurred in the past. The analysis of cumulative effects evaluates the impact on MIS habitat from the existing condition within the wildlife analysis area.

The fuelwood gathering and Christmas tree cutting programs on the PNF are ongoing programs that have been in existence for years and are expected to continue. The past and future effect of these actions has been to reduce the number of snags and down logs, while generally retaining continuous forest cover which would negatively affect snags in green forest habitat.

Cumulative Effects Conclusion

It is anticipated that implementation of the proposed action, in combination with present and reasonably foreseeable future actions (namely woodcutting), would have some cumulative effect to the population and habitat distribution across the Plumas National Forest.

Summary of Hairy Woodpecker Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the hairy woodpecker; hence, the snag effects analysis for the Bootsole Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the hairy woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend

The current average number of medium-sized and large-sized snags (≥ 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA 2010a).

Population Status and Trend

Monitoring of the hairy woodpecker across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes mountain quail, fox sparrow, and yellow warbler (USDA 2010b, http://data.prbo.org/partners/usfs/snmis/). Hairy woodpeckers were detected on 15.1% of 1659 point counts (and 25.2% of 424 playback points) in 2009 and 16.7% of 2266 point counts (and 25.6% of 492 playback points) in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.116 in 2009 and 0.107 in 2010. These data indicate that hairy woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. In addition, the hairy woodpeckers continue to be monitored and surveyed in the Sierra Nevada at various sample locations by avian point count and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of hairy woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Hairy Woodpecker Trend

The direct, indirect, and cumulative effects of the Bootsole Project, in terms of potential medium-sized and large-sized snags per acre within green forest habitat, would change with time the amount and distribution of snags in green forest habitat within the wildlife analysis area. However, it will not lead to a change in the distribution of hairy woodpecker across the Sierra Nevada bioregion.

Snags in Burned Forest Ecosystem Component (Black-backed woodpecker)

Habitat/Species Relationship.

The black-backed woodpecker was selected as the MIS for the ecosystem component of snags in burned forests. Recent data indicate that black-backed woodpeckers are dependent on snags created by stand-replacement fires (Hutto 1995, Kotliar et al. 2002, Smucker et al. 2005). The abundant snags associated with severely burned forests provide both prey (by providing food for the specialized beetle larvae that serve as prey) and nesting sites (Hutto and Gallo 2006).

Project-level Effects Analysis – Snags in Burned Forest Ecosystem Component

Habitat Factor(s) for the Analysis:

1. Medium (15-30 inches dbh) snags per acre within burned forest created by stand-replacing fire.
2. Large (greater than 30 inches dbh) snags per acre within burned forest created by stand-replacing fire.

Current Condition of the Habitat Factor(s) in the Project Area:

The Bootsole Project wildlife analysis area does not contain any areas of burned forest.

Direct and Indirect Effects to Habitat.

While the Bootsole Project does not propose to treat any burned forest areas, so there would be no direct effects to burned forest habitat. However, one purpose of the project is to reduce the potential for the type of stand-replacing fire that creates burned forest habitat important for black-backed woodpeckers, so there could be an indirect effect of reduced occurrence of burned forest within the analysis area. Treatments may reduce the amount of high severity burned forest in the analysis area. However, 80% of the analysis area would remain untreated, leaving some areas vulnerable to high severity fire conditions. Research indicates that black-backed woodpeckers prefer areas burned at mixed severity and avoid large patches of high severity burn (Stillman et al. 2019a, Stillman et al. 2019b). Treatments are expected to reduce the risk of stand replacing wildfire, and result in lower-intensity or mixed severity burn conditions, which could result in higher quality black-backed woodpecker habitat if a fire were to occur.

Underburning activities in the Bootsole Project area may result in the mortality of some large trees which would be beneficial to recruitment of snag habitat. Black-backed woodpeckers have been observed in areas on the Beckwourth District shortly after prescribed fire treatment (NRIS database records from 2019).

Cumulative Effects to Habitat in the Analysis Area.

Variable density thinning will reduce potential for high severity fire overall within the analysis area while leaving patches of higher tree density that could result in recruitment of snag habitat under fire conditions. Reduced density and improved forest health will allow stands to develop larger trees in the future, which could become important black-backed woodpecker habitat if the area burns at mixed severity.

Cumulative Effects Conclusion

It is expected that implementation of the proposed action, in combination with present and reasonably foreseeable future actions, would result some cumulative effect to the habitat within the analysis area but would not affect population and habitat distribution across the Plumas National Forest.

Summary of Black-backed Woodpecker Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the black-backed woodpecker; hence, the snags effects analysis for the Bootsole Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the black-backed woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend

Current average number of medium-sized and large-sized snags (> 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these forest types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA Forest Service 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

These data include snags in both green forest and burned forest. Between 2000 and 2007, 211,000 acres underwent severe burn and 176,000 acres underwent moderate burn in the Sierra Nevada.

Population Status and Trend

Monitoring of the black-backed woodpecker across the 10 National Forests in the Sierra Nevada has been conducted since 2008 in partnership with the Institute for Bird Populations (IBP) (USDA Forest Service 2010a, http://www.birdpop.org/Sierra/bbwo.htm). In 2008, black-backed woodpeckers were detected at 68 survey stations distributed across 10 of the 19 fire areas surveyed. In 2009, black-backed woodpeckers were detected at 169 survey station distributed across 28 of the 51 fire areas surveyed. In both years, occupied sites were well distributed across the Sierra Nevada national forests, included burned areas of a variety of sizes, and included areas 1 to 10 years post-fire. These data indicate that black-backed woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. Additionally, mean occupancy probability for stations surveyed during 2009 was 0.253 (95% credible interval: 0.222 – 0.289); applying this probability across the 10 national forests yields an estimate that approximately 81,814 ha (25.3%) (range of 71,921 – 93,610 ha) the 323,358 ha of burned forest (burned between 1999 and 2008) on the ten national forest units within monitoring area was occupied by Black-backed

Woodpeckers in 2009. In addition, the black-backed woodpeckers continue to be surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of black-backed woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Black-Backed Woodpecker Trend

There would be no immediate change in the number or density of burned forest snags in the Bootsole Project Area. The Bootsole Project would not lead to a change in the distribution of black-backed woodpecker across the Sierra Nevada bioregion.

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